

Lymphatic Filariasis

Lymphatic Filariasis

❖ Introduction :-

- Filariasis is a disease group affecting humans and animals, caused by filariae.
- Filarial worms are tissue-dwelling nematodes.
- Mosquitoes of the genera *Aedes*, and *Anopheles* are the most common intermediate hosts and vectors that cause lymphatic filariasis.
- The filarial worms *Wuchereria bancrofti* (90%) and *Brugia Malaya* (10%) cause clinical outcomes ranging from subclinical infection to hydrocele and elephantiasis.

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❖ Introduction :-

- **W. bancrofti** is usually transmitted by night-biting culicine or anopheline mosquitoes.
- The adult worms are:-
 - ✓ 4–10 cm in length.
 - ✓ live in the lymphatics.
 - ✓ The females produce microfilariae that circulate in large numbers in the peripheral blood, usually at night.

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❖ Pathology and Pathogenesis :-

- The larval stages are inoculated by biting mosquitoes or flies.
- The larvae develop into adult worms (2–50 cm long).
- After mating, produce millions of microfilariae (170–320 μm long) that migrate in blood or skin.
- The life cycle is completed when the vector takes up microfilariae by biting humans.

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❖ Pathology and Pathogenesis :-

- In the insect, ingested microfilariae develop into infective larvae for inoculation in humans, normally the only host.
- Disease is due to the host's immune response to the worms, and its pattern and severity vary with the site and stage of each species.
- The worms are long-lived: microfilariae survive 2–3 years and adult worms 10–15 years.
- The infections are chronic and worst in individuals constantly re-infected.

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❖ Pathology and Pathogenesis :-

❑ Several factors contribute to the pathogenesis of lymphatic filariasis includes :-

- ✓ The quantity of accumulating adult worm antigen in the lymphatics.
- ✓ The duration and level of exposure to infective insect bites.
- ✓ The number of secondary bacterial and fungal infection.
- ✓ The degree of host immune response.

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❖ Pathology and Pathogenesis :-

- Toxins released by adult worms cause lymphangiectasia; this dilatation of the lymphatic vessels leads to:-
 - ✓ lymphatic dysfunction.

✓ The chronic clinical manifestations of:-

- lymphatic filariasis.
- Lymphoedema.
- Hydrocele.

- Death of the adult worm results in acute **filarial** lymphangitis.

Lymphatic Filariasis

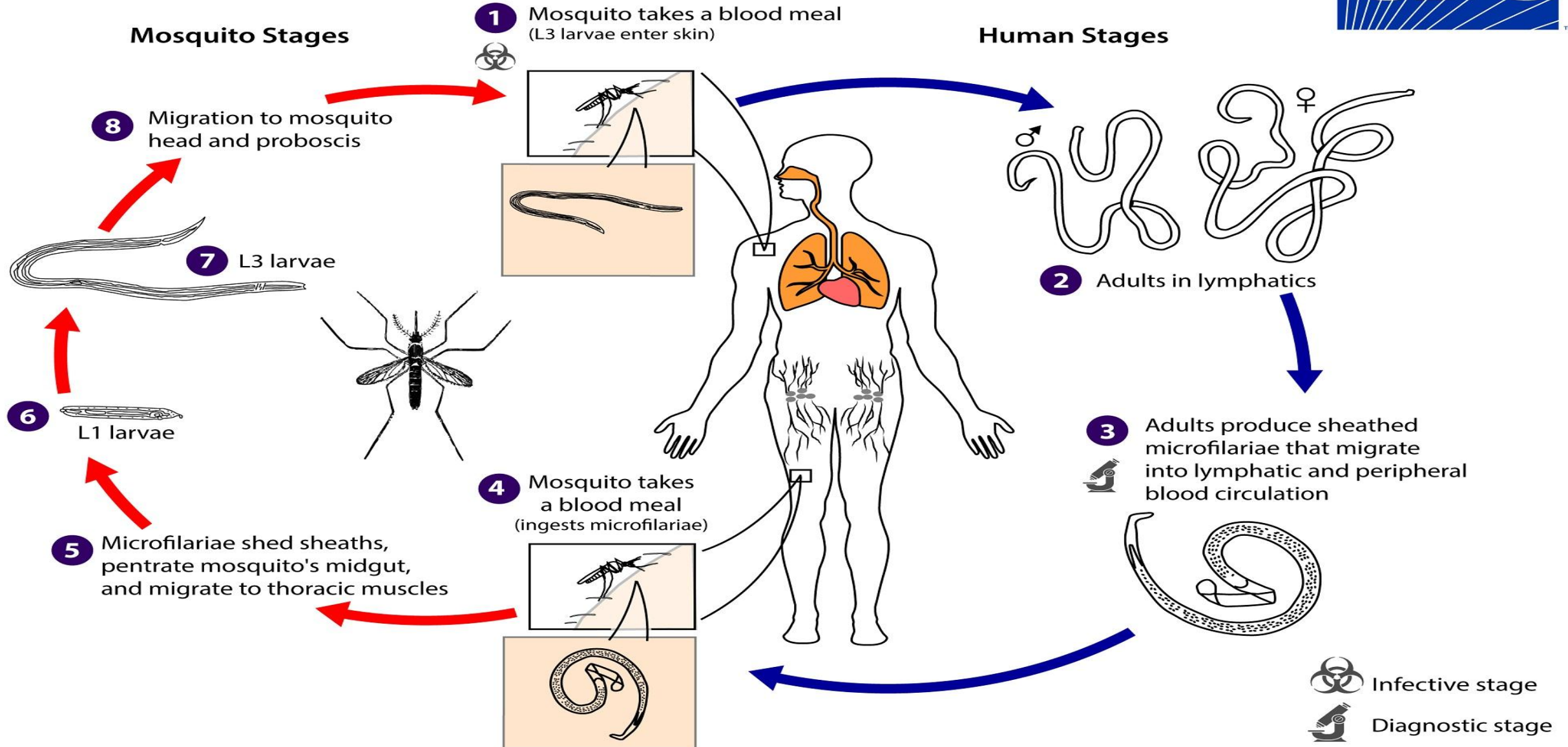
❖ Pathology and Pathogenesis :-

- Lymphatic obstruction persists after death of the adult worm.
- Secondary bacterial infections cause tissue destruction.
- The host response to microfilariae is central to the pathogenesis of tropical pulmonary eosinophilia.

❖ Life cycle of wuchereria bancrofti



Wuchereria bancrofti



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❖ Clinical features :-

➤ The clinical course of lymphatic filariasis is divided in to the following :-

❑ Asymptomatic microfilaremia :- up to 70% of infected individuals.

❑ Acute filarial lymphangitis :- presents with

✓ Fever.

✓ Pain.

✓ tenderness and erythema along the course of inflamed lymphatic vessels.

✓ Regional lymphadenopathy.

✓ Inflammation of the spermatic cord, epididymis and testis is common. Episodes last a few days but may recur several times a year.

✓ Temporary limb and genital edema becomes more persistent.

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❖ Clinical features :-

❑ Chronic, irréversible lymphoedème :-

- ✓ Progressive enlargement, coarsening, corrugation, fissuring and bacterial infection of the skin and subcutaneous tissue develop gradually, causing irreversible 'elephantiasis'.
- ✓ The scrotum may reach an enormous size, hydrocele, and penile swelling.
- ✓ Chyluria and chylous effusions are milky and opalescent; on standing, fat globules rise to the top.

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❖ Clinical features :-

❑ Tropical pulmonary eosinophilia is a complication

- ✓ Due to microfilariae trapped in the pulmonary capillaries that are destroyed by allergic inflammation.
- ✓ Patients present with paroxysmal cough, wheeze and fever.
- ✓ If untreated, this may progress to debilitating chronic interstitial lung disease.



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❖ Differential Diagnosis :-

- Acute lymphatic manifestations of filariasis must be differentiated from :-
 - Thrombophlebitis.
 - Infection.

- Edema and lymphatic obstructive changes must be distinguished from :-
 - Congestive cardiac failure.
 - Malignancy,
 - Trauma,
 - Idiopathic abnormalities Of the lymphatic system.

- Silicates absorbed from volcanic soil can also cause non-filarial elephantiasis.

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❖ Investigations :-

- In the earliest stages of The diagnosis is made on:- clinical grounds, supported by eosinophilia and sometimes by positive filarial serology.
- The detection of Microfilariae in the blood smear at night.
 - The microfilariae become difficult to find when elephantiasis develops.
- Circulating filarial antigen (CFA) are now routinely used to diagnose W bancrofti infection.
- Immunochromatographic card tests:-
 - ✓ Highly sensitive and specific.
 - ✓ Commercially available.
 - ✓ Detect circulating W. bancrofti antigen using at any time of the day.

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❖ Investigations :-

➤ Indirect fluorescence and ELISA:-

- ✓ Detect antibodies in over 95% of active cases and 70% of established elephantiasis.
- ✓ The test becomes negative 1–2 years after cure.
- ❑ Serological tests cannot distinguish the different filarial infections.
- Calcified filariae may sometimes be demonstrable by radiography.
- Visualization of adult worms can be seen on scrotal ultrasound.
- PCR-based tests for detection of *W. bancrofti* and *B. Malaya* DNA from blood.

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❖ Investigations :-

➤ In tropical pulmonary eosinophilia;-

- ✓ Serology is strongly positive.
- ✓ IgE levels are massively elevated.
- ✓ Circulating microfilariae are not found.
- ✓ The chest X-ray shows miliary changes or mottled opacities.
- ✓ Pulmonary function tests show a restrictive picture.

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❖ Management :-

- Treatment is aimed at halting and reversing disease progression.
- Diethylcarbamazine kills microfilariae and adult worms.
- Most adverse effects seen with DEC treatment are due to the host response to dying microfilariae, which is directly proportional to the microfilaria load.
- The main symptoms are fever, headache, nausea, vomiting, arthralgia and prostration.
- These usually occur within 24–36 hours of the first dose of DEC.
- Antihistamines or glucocorticoids treat these allergic phenomena.

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❖ Management :-

- Combining albendazole with ivermectin in a single dose, with or without DEC (300 mg), is also highly effective in clearing the parasites.
- Treatment of Tropical pulmonary eosinophilia, DEC for 14 days is the treatment of choice.
- Active management of chronic lymphatic pathology can alleviate symptoms.
- Patients should be taught meticulous skin care of their lymphedematous limbs to prevent secondary bacterial and fungal infections.

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❖ Management :-

- Tight bandaging, massage and bed rest with elevation of the affected limb help to control the lymphoedema.
- Prompt diagnosis and antibiotic therapy of bacterial cellulitis prevent further lymphatic damage and worsening of existing elephantiasis.
- Plastic surgery may be indicated in established elephantiasis.
- Hydroceles and chyluria can be repaired surgically.

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❖ Prevention :-

- Treatment of the whole population in endemic areas, can reduce filarial transmission, with annual:-
 - ✓ Single-dose DEC (6 mg/kg), alone
 - Or
 - ✓ In combination with albendazole or ivermectin.
- Mass treatment should be combined with mosquito control programs.

Thank you